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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/825,636	04/04/2001	Scott D. Thompson	PP00-4	3822

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EXAMINER	
MILLER, BRANDON J	

ART UNIT	PAPER NUMBER
2683	2

DATE MAILED: 06/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/825,636	THOMPSON, SCOTT D.	
	Examiner	Art Unit	
	Brandon J Miller	2683	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-44 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-44 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 9, 12, 19, 26, 30, 33 and 39-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Petry.

Regarding claim 1 Petry teaches a wireless network system including a communication hub linked to a source (see col. 1, lines 29-33 and col. 2, lines 15-18). Petry teaches at least one remote station which communicates with the communication hub in order to exchange information with the source (see col. 1, lines 29-34 and col. 2, lines 15-18 & 62-65). Petry teaches each of the at least one remote station includes a directive antenna (see col. 1, lines 6-10). Petry teaches a multi-beam antenna connected to the communication hub to allow the exchange of information between the communication hub and each of the at least one remote station (see col. 1, lines 35-39 & 53-58 and col. 2, lines 15-25 & 50-53). Petry teaches the multi-beam antenna producing a plurality of beams for such exchange of information (see col. 1, lines 35-39 & 53-59 and col. 2, lines 62-65).

Regarding claim 2 Petry teaches a wireless network wherein there is a plurality of remote stations (see col. 2, lines 15-20).

Regarding claim 3 Petry teaches a beam former linked between the hub and the multi-beam antenna (see col. 1, lines 29-34 and col. 3, lines 10-18).

Regarding claim 9 Petry teaches at least one radio transceiver as part of the hub which is linked between the source and the multi-beam antenna (see col. 2, lines 15-24).

Regarding claim 12 Petry teaches a radio transceiver for each of the at least one remote station as part of a hub which is linked between the source and the multi-beam antenna (see col. 2, lines 62-67).

Regarding claim 19 Petry teaches a multi-beam antenna including radiating elements on a circuit board (see col. 1, lines 5-10 and col. 3, lines 20-26).

Regarding claim 26 Petry teaches at least two non-adjacent beams of a plurality of beams are of a same frequency (see col. 1, lines 58-61).

Regarding claim 30 Petry teaches a wireless network system including a communication hub linked to a source (see col. 1, lines 29-33 and col. 2, lines 15-18). Petry teaches at least one remote station which communicates with the communication hub in order to exchange information with the source, each of the at least one remote station including a directive antenna (see col. 1, lines 6-10 & 29-34 and col. 2, lines 15-18 & 62-65). Petry teaches a multi-beam antenna connected to a communication hub to allow the exchange of information between the communication hub and each of the at least one remote station (see col. 1, lines 35-39 & 53-58 and col. 2, lines 15-25 & 50-33). Petry teaches a multi-beam antenna producing a plurality of beams for such exchange of information (see col. 1, lines 35-39 & 53-59 and col. 2, lines 62-65). Petry teaches a beam former linked between the hub and multi-beam antenna (see col. 1, lines 53-58 and col. 3, lines 11-18).

Regarding claim 33 Petry teaches a plurality of remote stations (see col. 2, lines 15-20).

Regarding claim 39 Petry teaches a source communicating with a plurality of remote stations using a wireless network system, the wireless network system including a communication hub linked to the source (see col. 1, lines 29-33 and col. 2, lines 15-18). Petry teaches at least one remote station which communicates with the communication hub in order to exchange information with the source (see col. 1, lines 29-34 and col. 2, lines 15-18 & 62-65). Petry teaches at least one remote station including a directive antenna (see col. 1, lines 6-10). Petry teaches a multi-beam antenna connected to a communication hub to allow the exchange of information between the communication hub and each of the at least one remote station, the multi-beam antenna producing a plurality of beams for such exchange of information (see col. 1, lines 35-39 & 53-58 and col. 2, lines 62-65). Petry teaches linking each of the at least one remote station to one of the plurality of beams (see col. 53-59 & 61-65 and col. 2, lines 50-53). Petry teaches coordinating sending and receiving of the information between the source and remote station by way of the plurality of beams using the hub (see col. 2, lines 15-24 and col. 3, lines 11-18).

Regarding claim 40 Petry teaches a beam former linked between the hub and the multi-beam antenna (see col. 1, lines 29-34 and col. 3, lines 10-18).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-5, 10, 14-18, 20-25, 27-28, 35, 37-38, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petry in view of Dent.

Regarding claim 4 Petry teaches a device as recited in claim 1 except for a beam former that includes the use of an NxN hybrid coupling matrix having N input ports and N radiating elements and wherein a value N may be any radix 2 number. Petry does teach specifically teach a beam former (see col. 3, lines 15-17). Dent teaches a beam that includes the use of an NxN hybrid coupling matrix having N input ports and N radiating elements and wherein a value N may be any radix 2 number (see col. 9, lines 18-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a beam former that includes the use of an NxN hybrid coupling matrix having N input ports and N radiating elements and wherein a value N may be any radix 2 number because this would allow for improved matrix processing, that would allow a plurality of receivers to efficiently receive its intended signal with substantially reduced interference.

Regarding claim 5 Dent teaches a beam former that includes fixed microwave frequency phase delays, microwave frequency couplers, and microwave radiators (see col. 7, lines 56-60, col. 12, lines 4-6, 13-14 & 59-62).

Regarding claim 10 Dent teaches a switching matrix as part of a hub which is linked between one of the at least one radio transceiver and multi-beam antenna and a switching matrix allowing service of more than one of the at least one remote station by one radio transceiver (see col. 9, lines 8-14 & 18-23).

Regarding claim 14 Dent teaches including more than one multi-beam antenna and wherein each of the multi-beam antennas includes a primary service sector which forms an area of plurality of beams of each of the multi-beam antennas (see col. 31, lines 41-46).

Regarding claim 15 Dent teaches including a received signal strength indicator device at the hub to monitor received signal strength of the beams and adapt power of the beams produced by the multi-beam antenna (see col. col. 3, lines 1-5).

Regarding claim 16 Dent teaches a controller for frequency coordination power control and data packet transmission (see col. 23, lines 61-67 and col. 24, lines 1-3).

Regarding claim 17 Dent teaches including a received signal strength indicator device at the at least one remote station to monitor received signal strength of the beams and adapt power of the beams produced by the multi-beam antenna (see col. 41, lines 42-49).

Regarding claim 18 Dent teaches a controller at the at least one remote station for frequency coordination, power control, and data packet transmission (see col. 13, lines 45-49, col. 18, lines 18-21, and col. 41, lines 42-49).

Regarding claim 20 Petry teach a device as recited in claim 19 except for a multi-beam antenna that is of microstrip construction. Dent teaches a stripline directional coupler network (see col. 12, lines 13-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a multi-beam antenna that is of microstrip construction because this would allow for more efficient configurations of the antenna facilities in a wireless network system.

Regarding claim 21 Dent teaches a source that is linked to the hub by the multi-beam antenna (see col. 7, lines 50-55 and col. 8, lines 20-25).

Regarding claim 22 Petry teaches at least one radio transceiver as part of a hub which is linked between a signal received by a multi-beam antenna and a port of the multi-beam antenna in which the signal is directed to so that the signal may be transmitted to one of the at least one remote station (see col. 2, lines 15-25 & 62-67).

Regarding claim 23 Dent teaches a device as recited in claim 10 and is rejected given the same reasoning as above.

Regarding claim 24 Dent teaches adjacent beams of a plurality of beams are of a different frequency (see col. 24, lines 7-11).

Regarding claim 25 Dent teaches at least one remote station that is within a 3 dB beamwidth of one of a plurality of beams (see col. 45, lines 63-66).

Regarding claim 27 Dent teaches at least two non-adjacent beams and remote stations linked to at least two non-adjacent beams include power adjustment such that sidelobes associated with communication of one of the non-adjacent beams is minimized so as to minimize interference with the other of the non-adjacent beams which are of the same frequency (see abstract, col. 4, lines 1-5, and col. 9, lines 16-20).

Regarding claim 28 Petry teaches at least two remote stations that utilize a same beam of the plurality of beams for communication that have a different polarization of the directive antenna at each of the remote stations (see col. 1, lines 6-10, col. 2, lines 15-24, and FIG. 1).

Regarding claim 35 Dent teaches a device as recited in claim 14 and is rejected given the same reasoning as above.

Regarding claim 37 Petry teaches a multi-beam antenna have at least two beams generated by the multi-beam antenna, where one is a first beam and the other is a second beam

(see col. 2, lines 16-25, col. 3, lines 15-18, and Fig. 1). Petry teaches a multi-beam antenna positioned between the at least two sources, such that the first beam is linked to one of the at least two sources and where the first and second beams are connected to provide a communication path between the at least two sources (see col. 1, lines 29-34, col. 2, lines 15-19 & 62-67, and Fig. 1). Petry does not specifically teach a wireless reflector system for communication about an obstruction, or at least two sources blocked by obstructions which are ends of a communication path. Dent teaches a wireless reflector system for communication (see col. 31, lines 50-55 and col. 45, lines 39-41). Dent teaches at least two sources blocked by obstructions which are ends of a communication path (see col. 11, lines 40-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a wireless reflector system for communication about an obstruction, or at least two sources blocked by obstructions which are ends of a communication path because this would allow for a plurality of receivers to efficiently receive its intended signal with substantially reduced interference.

Regarding claim 38 Dent teaches an amplification and signal processing device between the connected first and second beams to maintain signal integrity along the communication path between the at least two sources (see col. 4, lines 1-4 and col. 9, lines 6-23).

Regarding claim 43 Dent teaches a device as recited in claim 14 and is rejected given the same reasoning as above.

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petry in view of Dent and Niki.

Regarding claim 6 Petry teach a device as recited in claim 3 except for a beam former that is in the form of stripline etched patterns on at least one circuit board. Petry does teach a beam former (see col. 3, lines 15-17). Dent teaches a stripline directional coupler network (see col. 12, lines 13-15). Niki teaches antenna means and other electronics etched patterns on at least one circuit board (see col. 1, lines 55-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a beam former that is in the form of stripline etched patterns on at least one circuit board because this would allow for more efficient configurations of the antenna facilities in a wireless network system.

Regarding claim 7 Petry teach a device as recited in claim 3 except for a beam former that is in the form of microstrip etched patterns on at least one circuit board. Petry does teach a beam former (see col. 3, lines 15-17). Dent teaches a stripline directional coupler network (see col. 12, lines 13-15). Niki teaches antenna means and other electronics etched patterns on at least one circuit board (see col. 1, lines 55-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a beam former that is in the form of microstrip etched patterns on at least one circuit board because this would allow for more efficient configurations of the antenna facilities in a wireless network system.

Claims 8, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petry in view of Sydor.

Regarding claim 8 Petry teaches a device as recited in claim 1 except for an Ethernet switch as part of the hub which is linked between the source and the multi-beam antenna.

Sydor teaches an Ethernet switch as part of the hub which is linked between the source and the multi-beam antenna (see abstract and col. 10, lines 54-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an Ethernet switch as part of the hub which is linked between the source and the multi-beam antenna because this would allow for an improved wireless communication system for use in delivering data from a service provider to a plurality of clients.

Regarding claim 11 Sydor teaches an Ethernet switch as part of the hub which is linked between the source and at least one radio transceiver (see abstract and col. 10, lines 54-58).

Regarding claim 13 Sydor teaches a device as recited in claim 11 and is rejected given the same reasoning as above.

Claim 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petry in view of Kuntman.

Regarding claim 29 Petry teaches a device as recited in claim 1 except for a multi-beam antenna that is a circuit board of radiating elements covered by a radome. Kuntman teaches an antenna that is a circuit board of radiating elements covered by a radome (see col. 20, lines 58-63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include a multi-beam antenna that is a circuit board of radiating elements covered by a radome because this would allow for a flexible antenna array system used in wireless communication.

Claims 31-32, 34, 36, 41-42, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petry in view of Dent and Sydor.

Regarding claim 31 Petry and Dent teaches a device as recited in claim 30 except for an Ethernet switch as part of a hub and linked between the source and the beam former. Sydor teaches an Ethernet switch as part of the hub which is linked between the source and the multi-beam antenna (see abstract and col. 10, lines 54-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the device adapt to include an Ethernet switch as part of a hub and linked between the source and the beam former because this would allow for an improved wireless communication system for use in delivering data from a service provider to a plurality of clients.

Regarding claim 32 Sydor teaches at least one radio transceiver as part of a hub and linked between the Ethernet switch and a beam former (see abstract and col. 10, lines 54-58).

Regarding claim 34 Petry teaches a plurality of remote stations (see col. 2, lines 15-20).

Regarding claim 36 Dent teaches a device as recited in claim 14 and is rejected given the same reasoning as above.

Regarding claim 41 Petry, Dent, and Sydor teach a device as recited in claim 31 and is rejected given the same reasoning as above.

Regarding claim 42 Petry, Dent, and Sydor teach a device as recited in claim 31 and is rejected given the same reasoning as above.

Regarding claim 44 Dent teaches a device as recited in claim 14 and is rejected given the same reasoning as above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kanamaluru et al. U.S Patent No. 6,370,398 discloses transreflector antenna for wireless communication system.

Lopes et al. U.S. Patent No. 6,453,176 discloses antenna array system.

Hottinen et al. U.S Patent No. 6,584,302 discloses a method and arrangement for forming a beam.

Hagerman et al U.S. Patent No. 6,301,238 discloses a directional-beam generative apparatus and associated method.

Zhao U.S Patent No. 6,463,303 discloses a beam forming and switching architecture

Shoki U.S. Patent No. 5,894,598 discloses a radio communication system using portable mobile terminal.

Labonte et al. U.S Patent No. 6,259,918 discloses a preservation of cell borders at hand-off within a smart antenna cellular system.

Djuknic et al. U.S. Patent No. 5,974,317 discloses cell-clustering arrangements and corresponding antenna patterns for wireless communication networks employing high-altitude aeronautical antenna platforms.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandon J Miller whose telephone number is 703-305-4222. The examiner can normally be reached on Mon.-Fri. 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 703-308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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June 17, 2004

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